approach

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ENGINEERING

Is Safety a Dirty Word?

SAFETY has an image problem in our business.

"What sort of pilot is Joe?"

"Well, he's a safe pilot."

Not too many pilots would want that said about them, because it is damning by faint praise. Few citations start out with, "For being very safe . . . . If given a free choice of department head jobs in a squadron, or on a carrier, would Safety Officer be your first choice? Not likely. Would you rather have your command get the battle "E" or the safety "S"? The saying goes, "You never win a game by playing it safe."

Early occupational safety programs did not help this image. They tried to eliminate accidents by eliminating all risk. Since risk is a natural prerequisite to gain, the only truly safe organization would have been the organization that did nothing. Safety people became stereotyped as beady-eyed little wimps in hard hats always lurking in the shadows, ready to put you on report for some Crime Against Safety. They were also known to publish reams of incomprehensible regulations that were impossible to abide by and seemed to interfere with your every act of free will.

The professional attitude toward safety today is that it is simply risk management. We are learning to only take the risks that produce results and not the ones that just waste assets. Sure, there is a secondary benefit. Everyone gets a "stroke" from knowing their safety efforts have probably saved friends from pain and death, and saved the taxpayers a few million bucks here or there. But the main reason for safety is to keep as many planes, crews and support troops ready to fight as possible. And when the fight starts, our safety programs help us stay alive long enough to meet the enemy and return.

Maybe safety is a poor choice of words. Civilians are starting to use the term "loss control." We could call it "gouge standardization" or "headwork development," but it would be too much to say all the time. On second thought, safety doesn't sound so bad after all.

John Flynn
Editor

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F-14A Tomcat of VF-103 refuels from an Ohio Air National Guard KC-135. (VF- 103 TARPS photo)

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"Think" Training

By Richard K. Brown

HAVE you ever thought about *how* you think? Right now, for example, you are reading some words, you may also be peripherally seeing your desk, or the people around you, the good-looking girl in the next seat on the bus. You can hear various sounds. Perhaps you're feeling a bit tired after a hard day. Emotionally, you're not happy about your daughter marrying that bum. How does your mind handle all these inputs? And these are only the conscious impressions. A lot of your thinking at the moment is also coming from your subconscious, i.e., from similar experiences you've had in the past, from your attitude about authors in general or about safety. A veritable myriad of sensory data and incalculable impressions from your memory and from your emotional state are right now being processed by your brain into thoughts, ideas and concepts. It is incredulous how the brain accomplishes this function. Perhaps that's why we've spent so little time studying how to use it. Teaching people how to think is only now emerging in schools, colleges and universities as a viable subject of concern.

This article will point out some aspects of how our brain works in the process of thinking, then some important characteristics of a segment of our population — the pilot — and finally what we can do about the thinking process so crucial to his safety in flying. It is essential that not only pilots themselves understand how thinking has been ignored, but that you as managers of flying activities are able to apply the same knowledge to the training and supervision of your flight operation.

Dr. Karl Albrecht is one of several people who have recently begun to look at the area of thinking. His book "Brain Power" is an excellent expose. He quotes George Bernard Shaw in the preface. "Few people think more than two to three times a year. I've made an international reputation for myself by thinking once or twice a week."

I happen to believe that if we can improve the thinking skill of pilots who face highly complex decision-making situations — with a loaded deck, we'll do a lot better job of flying safely.

It is really appalling that we devote so little time to thinking. In fact we spend many hours avoiding it. We look for passive ways to spend our time. Spectator sports, for example, when we could be out participating. The worst contributor to passive activity is television. We seem quite satisfied to tune in the TV in the evening and hear the newscasters tell us over and over what we will hear if we stay tuned till 11:00!

Soap operas, situation comedies, sports events and movies far overshadow documentaries, educational programs and other thought-provoking subjects in time allotted by the media. Extensive watching can actually inhibit our mental skills. The watcher doesn't have to think to become involved, he is hypotized by the actors.

Albrecht says that recent research has shown that "the body becomes more or less inert with markedly diminished kinetic processes. Respiration and heart rate may decline

and attention narrows to include only the images on the screen and the sounds coming from the speaker. Shifting attention to other events or activities in the room requires an unwanted mental effort. *After spending about 30 minutes or more staring into a television screen at typical programming material, a viewer's brain is in a condition qualitatively similar to hypnosis."*

To prove this, try watching TV standing up. You'll find two rather dramatic results. You'll be much more observant and critical of the material including the commercials, and you will find yourself much more alert and aware of what you are doing.

Most of the thinking process is automatic and goes on below the level of our consciousness. It happens rapidly, extremely so, and involves the entire brain, the thought, the emotions, feelings and also the physical reaction of the body. This is called the subconscious. Much decision-making, task performance and even reasoning is done at the subconscious level. Deeply involved at this level is the memory. If a memory trace is stronger than what you are consciously perceiving, the brain will tend to substitute that memory trace for the new sensory data it is receiving. You can readily see how important this can be to pilots who are current in more than one aircraft at a given time and fly either one from day to day. Memory patterns on one hand help us to recognize familiar objects and experiences and heaven knows we *must* — we can't possibly ponder every experience as entirely novel — but on the other hand they can sometimes inappropriately direct one's behavior and restrict our thinking if we aren't alert to the possibility.

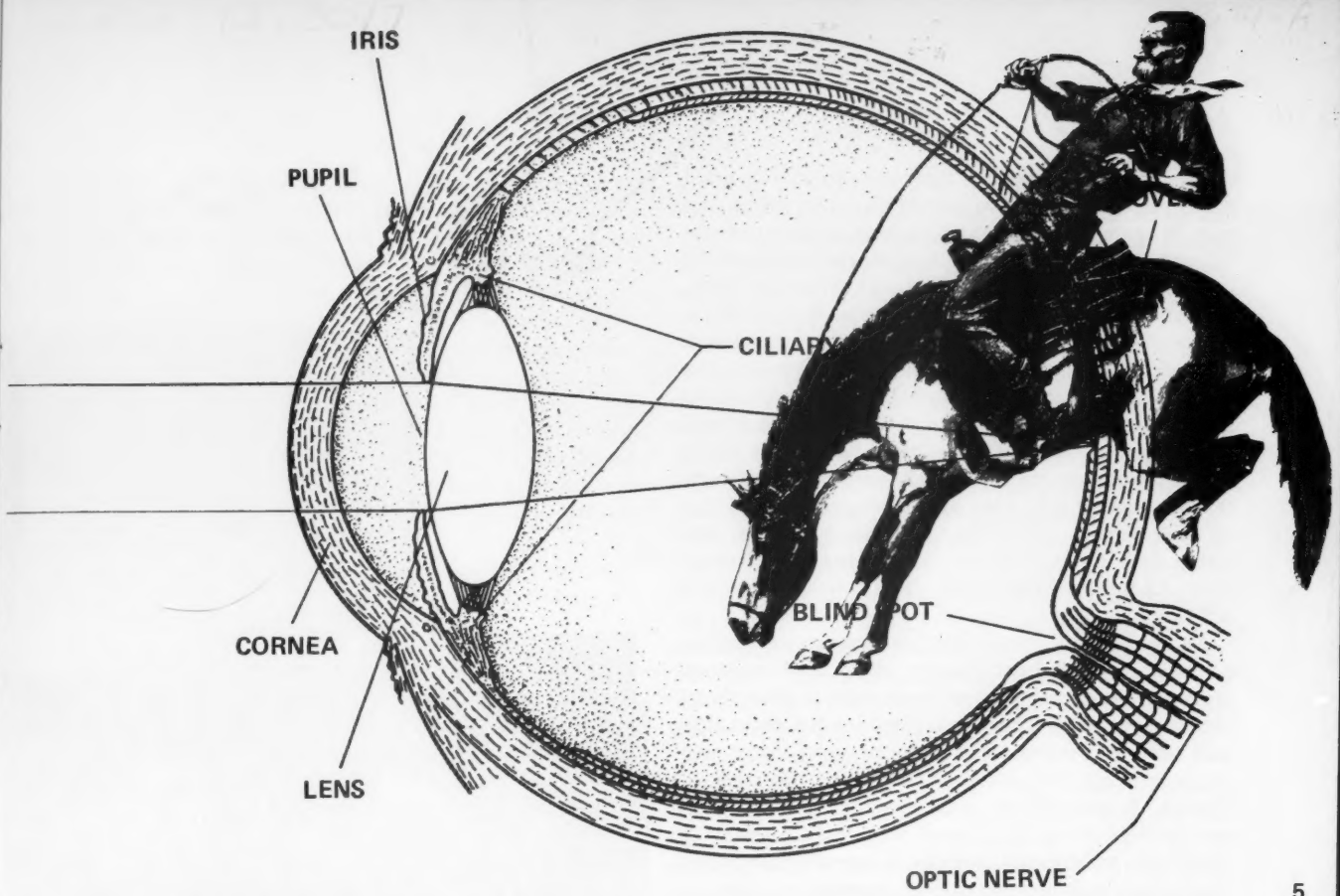
Conscious thought is slower, well identified by various sensory signals or inputs. There are three identifiable kinds of conscious thought — verbal, visual and kinesthetic. Each of the three plays an important role in the thinking necessary for a pilot to react appropriately to crucial circumstances he or she can encounter in flight.

Verbal thought is hearing your voice mentally expressing the words, phrases and messages the brain is receiving. Visual thought is the imagery you picture as a result of sensory stimuli. These visual pictures usually include images from the memory or subconscious as well as through the eye. Kinesthetic thought is the physical sensations one experiences as a result of receiving some sensory information. Perspiration, fear, anger, jealousy; all a part of the kinesthetic part of conscious thought. All three are sending signals to the brain constantly in the process of thinking. You see visual pictures of aircraft separation, you hear the words of the controller and you feel the pangs of fear because you've lost power on No. 2 engine. All three are acting on the brain to affect your behavior.

Let's look for a moment at the brain and at some of the ways in which it functions. It is about the size of a slow-pitch softball, rubbery texture, weighing about three pounds. The cerebral cortex is the largest part and consists of two hemispheres. Scientists believe that logical reasoning resides primarily in the left hemisphere. It processes sensory inputs into logical sequential patterns.

The right hemisphere prefers to deal with spatial relationships. It works with whole forms rather than the linear, sequential bits of data processed by the left brain. Visual structures rather than verbal seem to be the domain of the right hemisphere.

Although a great deal has been written on right-left brain theory and research, the whole brain is the subject of considerable attention today. No individual part of the brain right or left hemisphere, basal region (where involun-



tary reflexive activities are controlled), the cerebellum (where motor functions such as balance and coordination reside) or any other part work alone. More and more evidence is being found that indicates the involvement of the entire complex structure which includes over 12 billion neurons.

We can determine the primary location of some functions of the brain through studying disfunctions caused by brain damage. Destruction of the Common Integrating Area for example, which is about the size of a dime, renders the sufferer an idiot. Idiots are incapable of complete thought. If the motor area for speech is damaged, the person can form complete thoughts but can't speak them. If the damage is to the verbal processing center, the person can speak but the speech will have no meaning — a complete jumble of words.

Severe alcoholism or drug abuse can damage the brain so as to render the user incapable of appropriate conceptual thought, of carrying out a logical thought sequence or for making sensible or socially acceptable judgments about one's behavior.

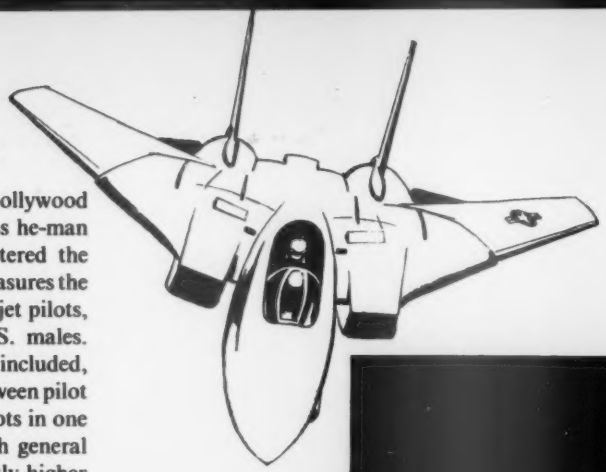
Although studies have isolated certain thought processes, most neural scientists now believe that memory, which we are most concerned with here, is spread across the greater area of the cerebral cortex. They have found that in spite of severe brain damage, patients have retained considerable memory traces and in some cases, the loss which does occur often does not vanish abruptly.

In my undergraduate psychology classes some years ago, I was admonished never to think of the brain as a muscle that could be exercised. The evidence compiled since those innocent days indicates that the brain can be exercised — not such that it improves the quality of tissue but that it can be tuned to sort more inputs and select the most appropriate data from all that is available.

We really don't know how this organism, the brain, manages to select from all the knowledge, facts and data together with their emotional connotations, the particular elements that comprise a logical conclusion. What is the weight given to a certain memory trace? How important is a conflicting sensory experience in comparison? The brain is able to associate all the pieces of information and derive an acceptable (comfortable or not) position. It does this so quickly that we can't possibly examine an individual thought process.

Further complicating this physiological functioning of the brain is the psychological impact of the personality on one's thinking. Few, if any, professional groups are as subject to this phenomenon as pilots.

Professor Chaytor Mason, internationally known aviation psychologist and lecturer from the University of Southern California, says that research strongly suggests that pilots really do fulfill their stereotype of being active, masculine individuals — strong, competent and adventuresome. One of the supporting studies was done at two Michigan



universities and suggests that "the time-honored Hollywood stereotype of the aviator as a romantic, dauntless he-man may be quite true." These researchers administered the Edwards Personal Preference Schedule (which measures the interest and motivations of individuals) to Navy jet pilots, general aviation pilots and non-flyer adult U.S. males. Although no corporate or commercial pilots were included, the findings appropriately indicate differences between pilot and non-pilot groups. They also confirm that pilots in one group differed little from those in another. Both general aviation pilots and Navy pilots scored significantly higher on five factor areas and significantly lower on seven factors than the average U.S. male. Both pilot groups scored high on Achievement, Exhibition, Dominance, Change and Heterosexuality and relatively low on Abasement, Nurturance, Endurance, Deference, Order, Succorance and Affiliation.

Another study of personality characteristics was done on a population of aerobatic pilots by Oglivie and Pool. It was reported that ". . . this group would seem to resent being babied or pampered. They would have a low tendency to feel guilt for wrong-doing or to accept personal blame, and certainly would feel no inner need to be punished for failures." In spite of their choice of aerobatics as a regular activity, Oglivie and Pool found them to be basically an emotionally healthy reality-oriented sample of human beings. "Individuals with neurotic or over-compensatory features within their personality were the exception." *They, like our Navy and general aviation pilots, were found to enjoy talking about personal adventures and experiences and to seek and enjoy the spotlight and being noticed. They also seemed to have a high need to be independent and to make their own decision, to do the unconventional and to avoid conforming to the expected and even criticizing those in authority.*

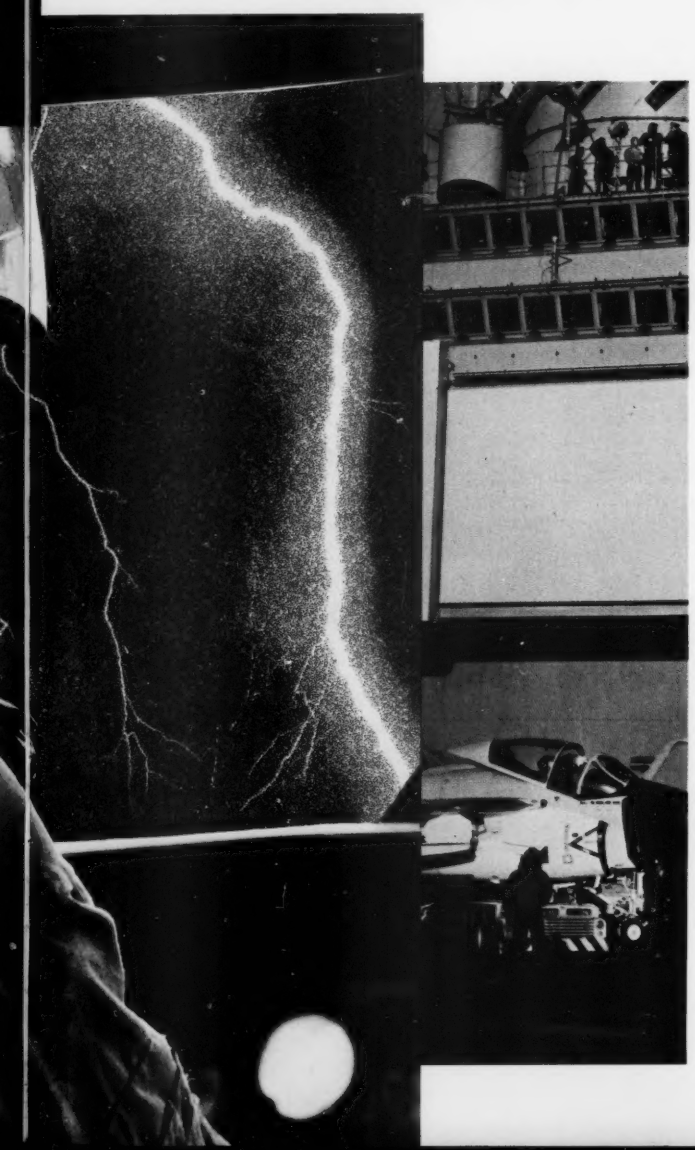
Another area greatly influencing the behavior of pilots is "Manhood," and although common to men in general becomes significantly more important in the safe operation of aircraft. Mason has done considerable work on this subject also and claims that the *concept of manhood* (which has been commonly accepted through man's history) *and safety are not compatible*. "Safety vs. Manhood is one of the reasons why young people have so many accidents in cars, boats and airplanes. It is one of the reasons why young people show little caution; because there is a more important purpose than safety — the proof of "manhood." Mason points out the slow development of protective gear in sports as another example. In baseball, broken hands were a mark of distinction until the glove was finally accepted. In the military even the "tin hat" was long banned by military generals because it signified cowardice. In fact, Col. Douglas MacArthur in 1917 stated, "I will not appear as a coward to my men by wearing a steel helmet."

The takeoff that should have been aborted (or never

started), the "unreasonable" striving to avoid landing at an alternate or refusing a prudent go-around so well known to experienced pilots are common occurrences often involving this concept of "manhood."

Adding to this syndrome of special personality characteristics is their exceptionally high skill level. According to Dr. Grimaldi, pioneer and author in safety program management at USC, pilots and physicians are the best trained practitioners in the world — he's right — and they know it. They are intelligent and have mastered the skills required in their profession. This compounds the personality described above and manifests a fixated thinking pattern. They are not inclined to change opinions or concepts nor will subconscious memory traces be readily altered.

Fixated thinking was demonstrated in a classic experiment with pike (the fish) in an aquarium. Pike eat minnows like popcorn, so the researchers lowered a bell jar full of minnows into a tank of pike. The pike attacked the minnows, repeatedly bumping their noses on the jar time after time until they finally gave up. The bell jar was then removed and the minnows swam through the entire aquarium without one pike ever attacking them.



Opinionitis is also especially characteristic of highly trained people. They have formulated opinions from solid evidence and experience and sometimes doggedly cling to them even when, in our rapidly changing society, they just don't hold water. Perhaps you've not heard about the man who went around telling all his friends that he was dead. It became so annoying that one of them convinced him to go to a psychologist. The therapist, after a little counseling, asked him to stand in front of his mirror every day for 30 days and repeat to himself, "Dead men do not bleed." The patient did this for an entire month and reported back to the psychologist who asked him to clench his fist and repeat, "Dead men do not bleed." As he did, the therapist stuck a needle into his vein whereupon blood began to trickle down the arm. The patient looked at the blood then at the therapist and said, "I'll be damned, dead men do bleed."

Opinionitis can appear at an early age. A Sunday school teacher asked her children to draw a picture depicting the day's Bible lesson. One little boy drew what he said was a picture of God. A bit flustered, the teacher said, "But you must remember, nobody knows what God looks like." The boy confidently replied, "Well, they will when they see this picture."

Thus far, I've discussed only the individual. How we as individuals think, the physiological organ we use and personality variables. The environment in which pilots work also introduces uncommon hazards. Flying presents many pressure situations. Alternate landings, power loss, severe weather. You know all of these situations. But here is the real kicker, physiologically our higher level thinking ability suffers under these emergency conditions. The very elements of thinking that we need most bow to the increased flow of hormones. Idea production, decision making, logical reasoning and memory!

This is why we use checklists and practice emergency procedures over and over and over, so that presumably, we won't need to rely on our conscious faculties and can react automatically. But remember what has been said about the "automatic-reflexive" responses? The brain selects from a storehouse of data, subconscious and conscious — can we be sure it selects appropriately? ◄

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Rotorheads Headsup. The H-3 had been conducting practice approaches to the west coast OLF. The tower cleared the Sea King for a landing on runway 26 which was parallel with runway 27 on the same field. Immediately afterward, a CH-46D called for a 90-degree practice autorotation and was cleared to 27 and advised of the H-3 traffic. The CH-46 rogered the traffic, visually acquiring the H-3 slightly ahead and below, apparently heading for runway 26.

Commencing their practice autorotation, the Sea Knight crew turned their attention to the landing and lost sight of the H-3. Approaching the 100-foot mark, which signaled the end of their practice autorotation, the CH-46 pilot lowered the nose, at which time the instructor pilot caught sight of the H-3 immediately below him in the chin bubble. The IP took control and initiated a waveoff.

Several factors contributed to this near midair. The parallel runways — one of which (26) is a V/STOL strip — at this OLF are fairly close, allowing for minimum traffic separation on simultaneous approaches. The H-3 had made several previous approaches to runway 27, but was shifted to the shorter 26 for its stop and go. Its pilots apparently didn't make the shift mentally, however. A chain of events was set up pointing toward disaster. Only the attention of the CH-46 IP broke the chain, narrowly averting damage and possible loss of life and aircraft, which really points out the bottom line in any flight-related situation: the pilot. Ultimate safety for the flight rests with him; safety for preflight procedures, takeoff, conduct of the flight and recovery.

Inert Frag Patterns. Three AV-8Cs launched for a weapons hop armed with inert 2.75-inch rockets. The release parameters were: 10-degree dive, 450 knots, 1,000-foot AGL release, with aircraft recovery at 700 feet AGL. Arriving over the range, the Marine aviators completed their ordnance runs. When they brought their aircraft back, they were surprised to find various indications of frag damage to two AV-8s.

In a recent, similar occurrence, a TA-4F fired its load of 2.75s and received frag damage to its port wing root. In this instance, the release parameters were: 10-degree dive, 400 knots, 800-foot AGL release, with a 500-foot AGL pullout. While aggressiveness is desirable in a tactical aviator, it should be seasoned with a large dose of caution, especially in a training situation.

The normal frag pattern for a 2.75-inch rocket with an HE warhead is 700 to 1,000 feet. With a well-raked *inert* target, the possibility of ricochet still exists which may be a threat above 700 feet AGL with a low-dive angle rocket release. If the range is a live ordnance range, then the delivery parameters should be adjusted as necessary for poten-

AIR BREAKS

tial secondary explosions.

Whether it's called inert or practice ordnance, it should all be treated as the real thing in order to train as we intend to fight. The aircraft tactical manuals have the information. In addition to the release parameters, the manuals contain notes, cautions and warnings appropriate to the type of aircraft. If you haven't read the book for a while, maybe it's time for a refresher.

Release parameters exist for safety and effectiveness. Let's not do the enemy's job. — Ed.

Twinkletoes Seasprite. The SH-2F pilot landed at a southeastern NAS, and following the taxi director's signals, brought his aircraft to a halt at the transit line. Setting the brakes, he signalled for the chocks to be inserted at the main wheels. As the linemen moved to comply, the Seasprite's tail began to swing to the right and the right main wheel rolled forward. The reason was improper setting of brakes, and application of too much pressure on the left brake as the helicopter began to swing.

The chock being placed in front of the right main wheel jumped, hitting the lineman on the right hand, while the main wheel nearly ran over the man's right foot. Subsequent examinations and x-rays revealed, fortunately, no injury.

As long as the engine's burning, and rotor's turning, no one can afford to relax his vigilance and attention to safety. — Ed.

Oil In The APU. Conducting a routine training mission, a CH-46 was flying at 500 feet AGL and 110 knots when the No. 1 engine performance began to degrade. The HAC took control from the co-pilot who had been flying and turned the aircraft for home. Single-engine NATOPS were executed, but the crew chief reported smoke coming from the No. 1 engine bay doors. The pilot noted that although the Ng remained stable at 52 percent to 55 percent, the temperature rose to 950 to 1,000 degrees. The HAC shut the engine down, and the smoke disappeared.

By this time, the wingman had joined on the faltering Sea Knight and made a visual inspection to determine if there was, in fact, a fire. The wingman could see no fire, and the flight continued toward home. The tower cleared the first CH-46 for landing, and three miles from touchdown, the pilot called for an APU (auxiliary power unit) start. The wingman quickly called to report smoke beginning to come from the port side aft whereupon the HAC pulled the fire T-handle. (Better safe than sorry.) The helicopter made its landing without further complications.

Post-flight inspection revealed that an APU hydraulic line had become disconnected, allowing fluid to spray inside the APU compartment. Naturally, the mist of hydraulic fluid against the hot APU had caused, at first, smoke and would probably create a fire without much more operating time. Preflight had not indicated any problem with the hydraulic line. Adherence to NATOPS had allowed these aviators to bring their helicopter back, and a relatively simple repair to be made which might have otherwise cost an expensive aircraft and lives.

Modeller Mayhem. Congestion in the Pensacola/Whiting complex has reached epidemic proportions. It's bad enough when the aircraft involved both have normal human-type pilots flying them, but . . .

The TH-57A was returning to base from a routine training hop and had entered the designated entry channel in accordance with local course rules. The two pilots — the instructor and student — spotted what appeared to be a small target nearly head-on about 200 feet below. Its relative size and altitude made the target appear to be no matter for concern, and the helo pilots continued their scan away from the other aircraft.

Approximately four seconds later, the second aircraft materialized into a radio-controlled model, passing at an estimated 10 feet (!) from the TH-57 before diving below the Navy helicopter. The startled Navy crew made a rapid right turn away from the model airplane.

The pint-sized near midair had occurred because a local model club had established a miniature airstrip for their radio-controlled creations adjacent to the training airfield's entry channel. One point to consider is the small size of model aircraft. Pilots of most aircraft, military and civilian, use the size of the visual target as a cue denoting the relative closeness of the aircraft and the immediacy of evasive action being required. Although this method is fine in the "real" world, it goes right out the window when confronting the "little people" of the modeller's world. The small size of flying models makes their visual acquisition difficult and belated at best. It would behoove squadron operations officers (and maybe a few intelligence briefers) to know the location of active model clubs and pass that information on to flight crews. — Ed. ◄

Hauling Choppers Requires Special Knowhow

High Winds Can Wreak Havoc —

Skippers of amphibious assault ships are maintaining a weather eye more than ever these days. They want to protect the helicopters they haul in the event a northeaster comes up suddenly . . .

ON a cloudy evening, the CH-53D Sea Stallions landed on the docked amphibious assault ship (LPH). Soon they would be embarking on a trans-Atlantic deployment. The pierside fly-on went smoothly.

Only a few of the large birds could be stowed below. With the ship about to get underway, its limited storage space was nearly full already.

Most of the helos were spotted and tied down in accordance with prescribed standards to protect them from the expected elements. They were parked on the flight deck's aft end. Two were placed on the aft bone, part of each extending over the deck edge. Blades and tail rotor pylons were folded and secured properly. Blade struts were in place, blade boots and edge protectors were installed and cargo straps were attached correctly.

Steaming only a few hours, the LPH encountered high winds and rough seas. The forecast called for 25-knot winds increasing to 38 knots. Combined with the ship's planned course and speed, wind over the deck wasn't expected to exceed 60 knots. But now the wind was at a higher level — an estimated 70 knots — which signaled *trouble*.

In the adverse weather and darkness, though, it was too late to outmaneuver the storm and too dangerous to send crews topside. It was doubtful they could secure the helicopters better under the hazardous stormy conditions. Quite a predicament!

Yes, H-53s were banged up. Most of the damage occurred when blade struts broke free from blade sockets.

and Wreck Helos

By Bud Baer

A helicopter with its tail extending over the deck edge was put out of commission when a hole was torn in its tail pylon. Tail rotor blades were twisted by their tiedowns. Minor dorsal fin damage was caused from tiedown straps wrapped around the fins.

No helicopters were totalled or even damaged severely, but several were put out of commission — a critical loss mission-wise. This reduced aircraft readiness, and that's what the mission was all about.

This incident raised a number of points:

- The hangar decks of the 20-year-old LPHs initially accommodated an equivalent of 19 H-46 helicopters. Modification to the ships and the need to store more aviation equipment below have decreased their helo-usable hangar space to 16 H-46 equivalents or by 16 percent.
- The newer H-53s are larger and may be more susceptible to wind damage. Removal of H-53 blades for protection from the elements is more complicated and time-consuming.
- Questionable load planning and timing prevented maximum storage of helos on the hangar deck. Had the fly-on been completed before the LPH entered port, additional aircraft probably would've been moved into the hangar area and remained there. However, some aircraft would have been left on the flight deck exposed to the weather.
- Since the weather was worse than predicted, weather forecasting available to the ship left a good deal to be desired, as did procedures for steaming around and avoiding heavy weather with helos on the deck.

The mishap resulted in numerous conferences to improve guidelines to prevent a recurrence. To put teeth into the remedy, amendments were made to: COMNAVSURFLANTINST 3500.4C/COMNAVAIRLANTINST 3500.51.D/Fleet Marine Force Atlantic Order 3500.2D — *Amphibious Aviation Ship (LPH/LHA) and Embarked Aviation Unit(s) Readiness Plan.* Section A.17 stipulates that the ship will be provided "with a heavy weather storage plan 120 days before deployment."

Some specific points were recommended as a direct result of the incident and the following steps have been taken:

1. Helicopters considered to have priority for hangar deck stowage are being identified.
2. A pierside fly-on in conjunction with an embarkation evolution requires early-on, special approval.
3. A program to improve foul weather tiedown devices is under study at Naval Air Systems Command.
4. Vehicles, aviation spares and equipment once stored on the hangar deck have been moved either topside or to other ships to make room for more helicopters.
5. Weather forecasting capability has been improved by reporting and recording weather conditions more frequently and by using more experienced meteorological personnel and advanced equipment from outside sources.
6. The ship will sail only after helos are accommodated on the hangar deck or on the flight deck above, properly tied down, in accordance with the foul weather load plan.
7. The ship is prepared to deviate from the assigned course/speed to minimize effects of adverse weather on aircraft secured on the flight deck.

"We've made great strides to cure the problem and protect the helos from bad weather," according to Cdr. Charles W. McLaughlin, Force Aviation Safety Officer, Commander Naval Surface Force, Atlantic Fleet, Norfolk, Va. "Numerous readiness review conferences are held for each ship on a case-by-case basis. The ship receives a heavy weather storage plan from the operational helicopter squadron.

"The ship will not only follow the plan but do whatever is physically possible to protect the aircraft. The key to the solution is *preparation.* Because of the aerodynamic design, some helicopters ride out high winds on the deck better than others. For those that don't, such as the H-53s, we want to get them stowed below if at all possible. If we can't do that, we want to make them as weather-worthy as possible by beefing up tiedown procedures, removing blades or whatever. Now we're taking more time to plan for weather contingencies.

"The ship is advised on what helicopters should go below decks and what can remain topside; also, how and where the birds should be positioned and tied down. In other words, communications and a highly cooperative spirit between the ship and the squadron have increased substantially."

Bud Baer is a staff writer for Approach.

. . . It was too late to outmaneuver the storm and too dangerous to send crews topside . . .

Great Screamers I Have Known

By Peter Mersky

"GET those damn crash trucks moving! I'm running out of runway!!" It was my first jet hop, and the lieutenant up front was rapidly losing composure as we hydroplaned down the Warner Robins runway. The T-1A's tires were sliding on a layer of water deposited by a passing thundershower. It hadn't been too bad a flight until that point when the lieutenant turned onto final, under a dark buildup, heading straight for a curtain of water. The folks in the tower had not warned him of the storm, nor of the standing water on the runway. He had no fuel left for a go-around, so he was committed to the landing. And as he screamed at the Air Force tower to start the crash trucks, he tried to wrestle the Seastar onto the wet grass. Me? I just hung on in the back. Glurp! Glurp!

"You jerk," he yelled at me as we both stood outside the plane, looking at the blown left main tire. "If we had flipped over and burned, I wouldn't have come back to get you out, you can believe that!"

"Yessir," I acknowledged his wrath. Only now had the Air Force vehicles begun to move toward us. The lieutenant subsided a bit, but it was a momentary lull, for when the Air Force mechs began to jack the T-1 up *under* the wing instead of the landing gear strut — the proper procedure — he exploded again.

"Look out! What the hell are you doing. You'll punch a hole in the damn airplane!" He sputtered and fumed some more, and finally, the green-clad mechanics shrugged and left.

So there we stood, my lieutenant instructor — a transitioned helicopter pilot and now self-proclaimed ace-of-the-

base jet jock — and me, a newly commissioned ensign student NFO. What, me worry? The poor T-1A sagged in the wet grass and early rescue seemed a forlorn hope. After a call to Pensacola, the lieutenant returned and told me that a UC-45J (that's a twin Beech for you young folks out there) would haul an extra tire up to us as soon as possible — which would turn out to be 0200 the next morning. Until its arrival, there was little we could do except wait.

"I'm hungry," my instructor announced. "No money. You got some, ensign." It was not a question.

"Yessir," I replied with the most confidence I'd felt all afternoon. We wandered over to the base gedunk and ate some greasy burgers. As we left to check on the plane, he said, with an appropriate menacing tone, "I got to pay you back for that." Again, it really wasn't a question. "Oh, no, sir, that's okay." He jerked his head in a nod and grunted.

Well, we finally did get out of Robins — home of the C-130 — and flew back to Pensacola, landing at Sherman around 0400, taxiing around in the weeds and little blue lights. Of course, the dismal flight was my fault.

"I should give you a down," the instructor said later that afternoon, "but I won't." Big deal. It was only a fam hop anyway. Just a get-your-mask-and-climb-in-the-back flight. Actually the mask I'd been issued had a valve installed in reverse so I couldn't exhale. Luckily, I discovered this problem before we taxied and got it fixed, but he was nonetheless angry about the delay. Did I mention I had inadvertently released my leg restraints while he copied his takeoff clearance from Robins? If we'd have had to punch out, who knows what would have happened. But I sure wasn't going to tell him. So I sat in the dark and kept quiet.

I wished I had drawn one of the more even-tempered instructors. Some of the other students had really had good times on their jet indoctrination flights. They had even gotten to fly the aircraft under the benevolent guidance of their instructor. Not me, though. I'd drawn the "screamer."

There's a very fine line in instructing, as to when to sigh softly and when to yell loudly. It takes a real pro to know the difference. Nothing turns a student off more than to make a mistake and have the instructor come down hard on him with little room for breathing. Obviously, if someone isn't getting the program, he has to be — shall we say — *guided* along the right path. But out-and-out screaming and bad language seldom have the desired effect.

Granted my true story of one individual's detrimental instructional technique is toward the extreme, but everyone has stories about their personal favorites. The gulf between a student ensign and his lieutenant instructor is wider than other areas of the Navy rank structure. A chief is respected and consulted by his department head. A ship's skipper keeps his lieutenant commander XO informed and involved, and a two-star relies heavily on his chief of staff. But the relationship between a two-striper and his student is that of a king and serf. Even if the instructor is a benevolent king, the student is still the honey-bucket hauler.

Now there are some folks who might say, "Well-ll, maybe the screamer isn't the type you'd invite over for a friendly dinner after a hard day in the cockpit, but he does have his positive uses. After all, flying under pressure is what training is all about. If a student can't function when someone is only yelling at him, what's going to happen on a dark, rainy night . . . ?" Okay, maybe we ought to look at my "screamer" lieutenant's point of view.

"Look, I've got just a few short weeks to try to shape up this new ensign. He's just gotten his bars and he's really less than halfway through his training. After he's commissioned, he's still got a year's worth of training in front of him before he gets to a fleet squadron. At any point, he could run into trouble and lose those wings he's worked so hard for.

"If I baby him along, he'll lose his hard edge, and if he's a borderline case, anyway, maybe it's better we find out now rather than some dark, rainy night . . . .

That lieutenant is some screamer! I think he'd be more effective if he weren't a soprano.

"I've been there, too, you know. Getting *my* wings was no bed of roses. I had my share of screamers. I had one guy who used to throw his IFR supplement back at me at the least provocation. One student got so fed up with this behavior that he opened his canopy and tossed the instructor's book out of the airplane. Another instructor used to try to rattle you by spelling the word "down" each time you made a mistake. You'd be off the mark on your climbout speed by only three knots — three knots! — and after calling attention to the transgression, he'd go 'That's a D!' Then maybe you'd miss an intersection or use improper procedures somewhere. He'd sigh 'That's an O' into the ICS. And the flight would go downhill from there. The torture was excruciating."

Whatever the subjective case may be for making the

student work under pressure — the better to prepare him for the realities of the fleet — the fact is that there is little room in the modern training command for screamers and their heavy-handed teaching methods. Captain J.P. Smith, currently Chief of Staff at the Naval Safety Center, former Director of Aviation Safety Programs and a former commodore of Training Air Wing 5, recently commented, "Screamers are demoralizing . . . many times they are just burned out . . ." He went on to discuss the detrimental effect such instructors have on the struggling students, most of whom are trying to keep going, coping with their demanding new environment as well as satisfying their individual instructor's requirements. The last thing they need is someone yelling in their ears. Sometimes the instructor is too tired, mentally and physically, to treat the student in an even-handed manner. Again Captain Smith remarked, "The instructor should check himself in this situation before he enters the readyroom to brief his student. It might be a long day — back-to-back flights. Maybe the instructor did not get a decent lunch, or maybe he is deyhydrated from an intensive flight, or a long session on the hot ramp . . ."

A study* compiled in 1973 investigated those factors which contributed to a student's failure to complete the flight training program, whether he dropped or washed out. One section of the questionnaire given to the study group addressed those qualities in the best and worst instructors which students considered the most important. These qualities were not listed in order of importance. Even though the data is of 1973 vintage, its import is still valid, for even though the syllabus may change, people do not. Those instructor attributes which were important 11 years ago are still of vital concern today.

The study indicated that those instructors classified as "Best" had the following qualities: a sincere interest in the student; the ability to explain things well and to show the student how to correct his mistakes; patience; and a demonstrated feeling that the instructor and student were working together to improve the student's abilities and techniques.

Conversely, the instructors in the "Worst" category exhibited these mannerisms: pointing out mistakes without offering constructive suggestions on how to rectify the problem; no patience, usually commensurate with a "bad" attitude; failure to show encouragement, and a "screamer" image.

Basically, the study indicated the most effective instructors were those who understood student problems — both professional and personal — and helped the student overcome them, learning from his mistakes as he progressed through the syllabus. The instructor who showed he was there mainly to build up flight time, go up on a nice day or berate his student merely to rid himself of his own frustrations was of little or no use to the training command, much less his own individual students.

The "screamer" type of instructor has unfortunately not departed with the passage of time; he still exists — in limited quantities — in the modern training command, though these individuals are counseled as soon as they are discovered. Identification usually comes from the students through the critique sheets. But a lesser known but no-less effective way is the tie-cutting ceremony after a student solos. In a relaxed, "readyroom atmosphere," the SNA is allowed to say a few words after having his tie ceremoniously snipped. Usually, the student expresses his gratitude to his instructor for getting him this far and how much he is looking forward to the next phase. Occasionally, however, he takes the opportunity to take a few swipes at his instructor, if he feels he has been mistreated or poorly taught. Although a humbling experience, this instructor "roast" serves to identify those instructors who need counseling, especially if more than one or two students mention them during their remarks.

Normally, instructors who begin to gain a negative reputation get a chance to talk with their unit leaders or the ops officer; seldom does the XO or CO get involved, the situation usually being remedied prior to getting that far up the chain. One method of dealing with the instructor is to put him in another phase of the syllabus. Perhaps he is burned out, tired of his particular phase. Seeing the same mistakes over and over *can* be a wearing experience. Perhaps he can be moved from instruments to form or aerobatics, something to vary his environment and responsibilities. As Cdr. John Spahr, TRAWING 5 Safety Officer commented,

"How was the instructor *instructed*? . . . There should be more attention given to instructional techniques . . . more variety will reduce the instructor's frustration level and raise his 'patience level.'" Cdr. Spahr also indicated the feeling, substantiated by many people at Whiting, that the screamer is usually a low or medium achiever himself, who compensates for his own relative poor level of performance by demanding nearly unattainable standards from his struggling students. Usually, he is unaware of his own intensity or developing reputation until it is well established.

How a flight student perceives his "job" as an aviator and how he feels about his training throughout his tour in the training command determines how he carries himself professionally for the rest of his flying career (and perhaps his life as well). His attitude toward the preparation and conduct of each flight is created by the various instructors with whom he flies. A student's attitude and self-perception are literally in the hands of his instructors, and a good teacher can mold his student into the skilled and *safe* aviator we all want to be.

A Factor Analytic Study of Attritions From Naval Aviation Training Naval Aerospace Medical Research Laboratory, Pensacola, Florida

Peter Mersky is a staff writer for Approach.

Aircraft Status: UP or DOWN

by Maj. Larry D. Cohen, USMC

You walk into maintenance control after your flight and ask for a couple of gripe sheets, known affectionately as visual information display system/maintenance action forms, or more commonly, VIDS/MAFs. After writing a gripe, you work your way down the form to the "UP" and "DOWN" blocks. Do you have to mark the aircraft status? What criteria do you use? Who is responsible for analyzing discrepancies and certifying the aircraft "safe for flight"?

Let's start with the aircraft status. OPNAVINST 4790.2C says that after a flight, the pilot writes a VIDS/MAF for each discrepancy, annotating, among other items, the aircraft status. The decision should be based upon sound judgment, formed by experience and knowledge of the aircraft and appropriate directives. One instruction which can help is OPNAVINST 5442.4H. It contains the mission essential subsystems matrices, or MESMs (generally pronounced "mesums"). Any discrepancy that falls on the list of "Z" EOC coded items in the MESMs should down the aircraft. Worthy of note is the fact that the list of "Z" coded items is not very specific (e.g., airframe, engines, explosive devices, flight reference, oxygen system, etc.). For technical advice, the maintenance control chief or appropriate maintenance shop can provide guidance if you feel the discrepancy is in the "gray" area. But what about an item on the MESM that requires professional judgment rather than technical expertise?

For example, your lox gauge was inoperative, but you got good flow for the entire flight. The MESM says the oxygen system is a required item. Sure, the gauge is part of the oxygen system, but common sense and good judgment *should* prevail. You must consider not only the system or subsystem, but its relationship to the safe operation of the aircraft while carrying out its assigned mission. You can't assume the aircraft will only be used for a day VFR hop or that you will be the next pilot to fly this particular aircraft. Just because *you* would fly the aircraft again does not necessarily make it an "UP" gripe. *If in doubt, be on the conservative side and down the aircraft.* Some recent mishap cause factors are direct results of pilots' incomplete or inaccurate discrepancy reports and leaving a marginal aircraft in an "UP" status.

Now for the last question. Who is really responsible for ensuring that a discrepancy is signed off and certifying an aircraft safe for flight? Generally, three individuals: the maintenance officer, the material control officer and the maintenance control officer. However, anyone authorized and designated in writing by the commanding officer can assign the aircraft "safe for flight." These individuals are tasked to review the discrepancies and the corrective actions and determine the aircraft status.

The "UP" block checked by the pilot does not, in itself, make that discrepancy an "UP" gripe. All individuals who sign "safe for flight" should consider the pilot's recommendation, but the MESM, appropriate directives, local instructions, maintenance control, quality assurance and the shop "duty expert" all must be factors in determining the aircraft status.

The authority to assign an aircraft "safe for flight" is given to selected individuals and this responsibility should not be taken lightly. A "can-do" attitude must be tempered with experience, good judgment and common sense. Today's operational tempo requires maximum use of our assets, but the standard of quality must not infringe upon the safety margin demanded to safeguard our precious resources.

Maj. Cohen is the F-4 analyst at the Naval Safety Center, Norfolk, Va., a post he has held for two years. Previously, he was assigned to F-4 squadrons for five years at Marine Corps Air Station, El Toro, Calif. A 1969 Naval Academy graduate, Maj. Cohen has 3,700 flight hours, 1,750 of them in F-4s.

A Race With Nightfall

By Lt. Ned Leonard

"COMEX, Comex" crackled the radio. It was 1500 and the multiplane exercise was starting on time, proceeding as briefed just like the others. Each raid aircraft pilot called E-2C #603 with a "pushing" call, turned his transponder to standby and proceeded toward USS *Target* silently.

Suddenly, at 1525 a "beeper" on guard cut the silence. The crew of #603 tried unsuccessfully to get an ADF bearing on the weak locating signal. Then #104, one of the Orange raid aircraft, reported his wingman had been flying a loose formation and was now missing. The now missing #106 had been on a familiarization flight for the back seat and may have dropped back for safer clearance.

The crew of #603 tried to contact #106 on the various Orange, Blue and area frequencies and notifed the CV of the situation. The lost plane's wingman gave #603 his best guess of the last known position. The hummer crew plotted this information along with the known raid profile and came up with a 30 x 30 mile area in which to begin searching.

At this point various aircraft were reporting intermittent beeper signals, but no one could get an accurate ADF bearing to fix a position. An A-3 was chosen to be on-scene commander, the E-2C assumed duties as SAR mission coordinator and the CV was overall SAR coordinator.

Each of these roles involved specific areas of responsibility in the SAR organization. Would you have been ready to assume such a key position in a life or death scenario? Oh, you say you don't know exactly what an on-scene commander does? For readers unfamiliar with the SAR Tacaid, NWP 55-8-SAR, the following definitions may clear up some terminology:

The overall *SAR coordinator*, the CV in this case, supervises the operation and provides assets. The *SAR mission coordinator* (SMC) controls the SAR effort, designates frequencies, search patterns and logs the events for debrief. The SMC should also designate an *on-scene commander* (OSC). An E-2 is a natural for the SMC job because of an accurate plot of the "big picture," data link and versatile radio frequency coverage. If inorganic assets are available, the P-3 and E-3 also make excellent SMC platforms.

The on-scene commander was an A-3 in this case. He executed the SMC's plans, modified them to cope with the changing situation and gave weather, sea state and flight endurance reports to the SMC. The OSC also ensured altitude separation between search aircraft prepared to be the bird dog to maintain "on top" visual contact with the survivor once located.

The A-3 and S-3 make excellent OSCs because of long endurance and multiple radios. Other excellent OSCs include the P-3, A-6/KA-6, C-2 and F-14.

The search and rescue units (SRUs) carry out the search pattern and keep the OSC advised of ETA, on-scene endurance and search progress. This basic SAR organization delineates the responsibilities of every player and minimizes the ever-present confusion factor. More details on SAR organization can be found in the SAR Tacaid. The various search patterns are also described in this "SAR bible" but here are the basics:

An *expanding box* is for concentrated search of a small area. It starts at a datum and works outward in increasingly wide square turns.

Lt. Leonard is an E-2 CICO, formerly with VAW-112 on board the USS *Ranger*. He is currently assigned to NATO in Germany.

A *sector search* is a good way to use multiple SRUs to cover pie-shaped areas for longer coverage.

A *track crawl* is the preferred method to search when only the route of flight is known and involves paralleling the track.

A *creeping line* is a zig-zag pattern.

Those are the basics but NWP 55-8-SAR gives detailed diagrams of search patterns for all types of SAR operations with varying combinations of assets. Now back to the story . . .

Several A-3s were available for the search so the SMC designated them as SRUs in an *expanding* box pattern with hard altitudes assigned. A couple of S-3s from the CV joined the search at 1700. The E-2C relieved the A-3 as OSC 12 minutes later for fuel. The Hawkeye was now OSC and SMC.

The hummer crew, monitoring 282.8 and at 1720, suddenly heard a clear voice — "This is Lieutenant Commander Pilot, I am in the water . . ." The downed airman had no information about the crew member's status or his known location.

The E-2C could not fix a position on the PRC-90 transmission using ADF but circled back to where the voice signal was strongest. This was 30 nm from the original search effort, so the SRUs were relocated to the south. The clock was ticking, dusk was rapidly approaching and the layer at 1,000 feet had thickened into a handicapping overcast, limiting the number of aircraft that could search safely below the layer to one or two at a time. A commercial ship was spotted in the area and #603 attempted to contact her.

At 1730, S-3 #705 sighted Lcdr. Pilot in his raft. He had now been in the water over two hours. Immediately, the CV launched two helos for pickup 120 nm away. Meanwhile, the E-2C crew managed to contact the fishing vessel through the Coast Guard and passes vectors for possible pickup. At this point it was basically a race with nightfall and hypothermia — Lcdr. Pilot reported he was cold from the extended time in the heat-sapping water despite the relative comfort afforded by his life raft.

Number 705 then spotted the second survivor half a mile away, alive but almost motionless. Soon the outbound helos spotted two smokes lit by Lcdr. Pilot and maneuvered for pickup. This was the first time that any visual signal had been used; *the overcast layer had made long range visual signals useless.*

Three-and-a-half hours after ejecting, both airmen were on their way to the beach with nothing worse than one broken arm, a case of mild hypothermia and shock.

How would *you* have handled this SAR as OSC or SMC? Where would you start, what frequencies would you use, who should assist, what would be the best search pattern?

To be ready to assume a vital role in this type of drama you need to train as a squadron. Does your airwing or squadron SOP outline SAR procedures or, better yet, have a quick reference kneeboard card? Do you know distress and SAR frequencies, search patterns, different aircraft endurance and communication capabilities? Ensure you are up on the information in NWP 55-8-SAR (Rev. A) so you will be ready for that day . . . . "Mayday, mayday! This is Pilot on guard. I'm in the water, position unknown . . . ."

Birds In Hangars — A Messy Problem

By Lcdr. Bert Bivings

THE advances of modern man must be tempered by the realization of the magnitude of our mistakes. Long before the Wright Brothers ever flew, settlers from Europe longed for the familiar birds of their homeland. After numerous attempts, they were finally successful in establishing resident populations of starlings, house sparrows and pigeons (rock doves). They soon became abundant wherever man-made structures were available. When man decided that it was more fun to fix his flying machines out of the rain, he built hangars to house his airplanes. He soon learned of a different variety of indoor rain.

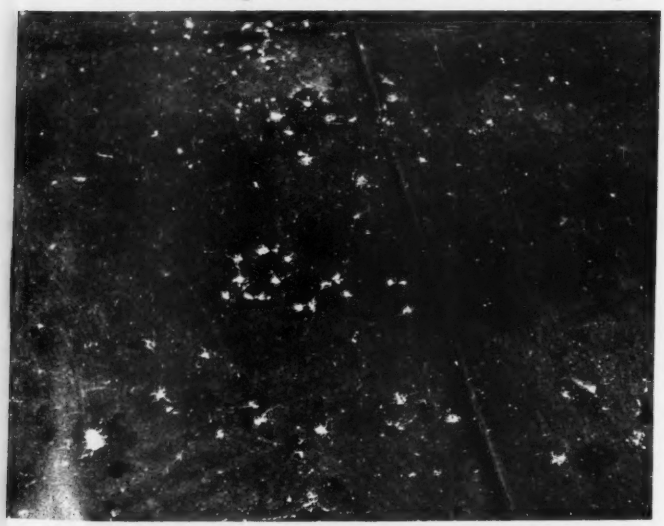
Specific health hazards are associated with the presence of birds in our hangars. But the most serious problems are those of morale and corrosion that come from the nightly rain of fecal material from roosting birds. The solution to the problem is to keep the birds out. Unfortunately, this isn't very easy to accomplish. It would be a small-scale problem if aircraft systems always functioned 4.0. Since airplanes do require maintenance, you have to open the hangar doors to move aircraft in and out on a regular basis, allowing these opportunists access to the rafters. The solutions then boil down to basically three areas: (1) kill all the birds, (2) scare them away or (3) exclude them from the hangar.

While it's easy to talk about killing birds, it turns out to be more difficult than it appears. Legally, feral pigeons, house sparrows and starlings aren't protected under federal law nor am I aware of any state laws protecting these species. Permits must be obtained for killing most other species of birds. Shooting birds may be sporting to some folks, but these species soon become exceptionally wary. Thus, the

project becomes very labor intensive after one or two days. There are also safety problems associated with live ammunition which are difficult to overcome. There are a few safe avicides registered, but poisoning birds is very difficult because, among other problems, they usually feed at several locations away from the roost site. Trapping in or around hangars is sometimes successful. Decoy traps for starlings, funnel traps for pigeons and pendulum traps or nest box traps for sparrows may be effective, especially for young birds. Trapping is time-consuming and all these species become trap-shy after a few days. In most situations, killing the birds doesn't turn out to be an attractive alternative, particularly if the CO's wife is a bird lover.

Scaring birds is an alternative but it's a time-consuming process. A combination of amplified bird distress and alarm calls and pyrotechnic (exploding) devices is usually effective. Passive devices such as owl decoys, flashing lights and rubber snakes are generally not effective unless accompanied by other scaring methods. While ultrasonic sound has been effective on rodents, I'm not aware of documented effectiveness on birds. It's very difficult to scare birds under extreme conditions, i.e., active nests, snow or ice cover outside, etc. Logistical problems exist since the pyrotechnic devices can't be used inside the hangar due to the fire hazard. Also, the equipment needed to scare birds is very expensive to purchase; thus, a source of loan equipment must be located such as the nearest animal damage control supervisor for the U.S. Fish and Wildlife Service. Scaring can normally be accomplished to give at least some relief. The major limitation with scaring or killing birds is that these solutions only offer short-term relief to the problem. They do nothing to change the overall attractiveness of hangars to birds.

The best long-term solution is to exclude the birds from the hangar. This can be accomplished using plastic netting which is available from several commercial sources. The Air Force has been successful using two different techniques to secure the netting to the underside of the trusses of a hangar to keep the birds out of the overhead. These are outlined in a publication titled "An Evaluation of Two Techniques for Installing Plastic Netting in Aircraft Hangars" (DEV-TR-83-01) by the Air Force Bird/Aircraft Strike Hazard (BASH) Team (AFESC/DEVN, Tyndall Air Force Base, Fla. 32403). Copies may be purchased from National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161. This is the best cure since it provides minimum interference with hangar use.



Air Force testing has shown no increase in fire hazard due to the netting and little effect on the water pattern when their overhead deluge sprinkler system was tested. Another potential system is to hang the netting across the doors in sections from the top of the door frame. It could then be rolled up and down on PVC pipe much like a bamboo curtain. The major limitation of this system is that it must be rolled up and down each time an aircraft goes in or out the hangar. Since the birds usually fly in and out in the upper one-third of the hangar door, some success has been obtained by using netting in the top part of the opening. However, nesting birds will usually find a way under the net. Some facilities have had success using sticky compounds to exclude the birds. These come in either liquid or paste formulations to be sprayed or applied with a caulking gun directly to the perch sites. Birds don't like the sticky texture and soon leave. Major limitations are high costs of both purchase and application and short duration of efficacy due to dust accumulation. There are several commercial sources for these chemicals; however, I would only recommend them if netting can't be used. A more permanent form of repellent is porcupine-like wires available commercially. These are strips of sharp, pointed wires that keep birds off ledges. These have been used successfully at some locations but are very expensive to purchase and install. After one or two large hangars, this material makes replacement aircraft look cheap. Again, I would only recommend this if netting can't be used.

While the potential for contracting any of the life-threatening diseases associated with the accumulation of bird droppings isn't high, the sanitation, corrosion and morale problems usually warrant action. Bird-proofing hangars is an involved process, but it offers the best long-term solution to the problem. Help is available through your NAVFACENGCOM representative, the Air Force BASH team (Autovon 970-6240) or through the author (Autovon 731-1110, ask the Little Rock Air Force Base operator for local number 387-5038). ◄

Lcdr. Bivings is a naval aviator who flew SH-3Ds in HS-3 from USS *Forrestal*. After release from active duty, he attended graduate school at Texas A&M University where he received a doctorate in wildlife and fisheries sciences. At A&M, he was 1,000 miles from the nearest helicopter, so he joined the surface reserve in a unit sponsored by the Office of Naval Research and the Naval Research Lab. In addition to his reserve duties as a research project officer, he works with the Naval Safety Center, the Naval Facilities Engineering Command and the Air Force BASH team to help solve bird/aircraft problems. He works full time as a wildlife biologist for the U.S. Fish and Wildlife Service, concentrating on migratory bird damage abatement.

Where The Next Aviation Mishap Will Occur . . . and What We Can Do About It

By Lt. R.H. Rutherford

FEW aviation safety officers have not been called upon for a solution to this question: Should this analysis be statistical or philosophical? In either case, if you succeed in pinpointing the cause and significant attention prevents a mishap, you may never find out if your study was an accurate one. That is, of course, the name of the game.

The statistical question is easy enough to answer. The Naval Safety Center tells those of us in the TACAIR community to expect four to five class A flight mishaps in the next quarter for the following reasons:

- Failure to recognize dangerous situations or inadequate evaluation of circumstances
- Loss of control
- Failure to maintain flying speed
- Inadequate flight preparation
- Misjudged altitude, distance or position
- Collision with ground/water
- Improper use of flight controls

The first thing you should notice is that these items can all be put in chronological order, beginning with inadequate flight preparation, progressing through loss of situational awareness, improper employment of the airplane and finally impact with the earth's surface.

Now I'm not saying that every pilot who ever flew into the water did so as a result of a poor preflight brief. Statistically, however, the next TACAIR aviation mishap almost certainly will occur as a result of combination of the above elements. The key, almost without exception, is that all mishaps are the result of multiple events. Let's face it; hardly anybody just plain forgets to lower the gear handle.

Have you heard all of this before? Well read on, you probably need to hear it again. *There are no new accidents in naval aviation.* Remember that one? Naval aviation safety is filled with old cliches, and if you think about

it, you'll know why. There is nothing new to say about aviation safety — in substance. Another cliche: Safety *is* an attitude. This state of mind must be continuously readdressed and re-emphasized if the program is to succeed. Here are more of my favorite safety cliches:

Know when to go — then go. This applies not only to ejection, but more routinely to bingo fuel situations and missed approach points in bad weather. This is a matter of personal discipline! Use the standards established in NATOPS and don't step over the line. That extra engagement or additional 50 feet on an approach just isn't worth it.

Always leave yourself an out. Since the next mishap will probably be the result of a combination of events, being prepared for an alternate course of action is imperative. Always have a plan before you hit the bad weather. Don't accept zero airspeed over the top. Even if it means losing the fight, you've learned the tactical lesson at that point.

Twelve Hours: Bottle to Brief. Sometimes 12 hours aren't enough! You Kamakazi headband owners know what I mean! Know when to stop — then stop. Personal discipline again.

It'll never happen to me. *Error in pilot judgment,* which is a major factor in a great many mishaps, can probably never be completely eradicated. Judgment and skill hopefully grow from experience; and there is little we can do to improve a pilot's judgment capabilities without experience. We as safety officers, commanding officers and *peers* can, however, ensure that in the course of gaining this experience, our fellow aviators aren't exposed to environments beyond their capabilities. This takes several forms. The obvious one deals with nugget aviators. Squadron COs and CAGs are pretty good about this. There aren't too many JGs flying in the airwing's first night blue water evolution of the turnaround. But how about the department head who has a cold? He's been med down for two days while all his pals fly and he does paperwork. How much pressure is he under to force an "up chit" even though he's probably not going to be 100 percent ready to fly for another two or three days.

How about the middle grade lieutenant, one cruise under his belt, who has gone "down" on his last two night man-ups for little problems, say, FOD in the cockpit or intermittent TACAN? On his third night out will he be as scrupulous as he was the first time or will he worry about being labeled a non-hacker and take an airplane against his better judgment?

In summary, I can't tell you specifically where the next aviation mishap will occur any more than the last guy who wrote on the subject. Nonetheless, we know why they have happened in the past and lack of personal discipline is definitely the odds-on favorite.

Setting standards at or above those published and not deviating from them is what has kept a lot of squadrons mishap-free for many years. Every squadron is going to get its share of average, above average and below average pilots. What makes the difference is the attitude these commands take toward each of these individuals. Probably one of the most important tasks facing a commanding officer is developing a frank and accurate assessment of the capabilities of each of his aviators — including himself. Now I refer not specifically to each man's talents as an aviator, but more in the direction of determining each man's ability to know his own limitations. What this means is that *your worst pilot is not necessarily your most dangerous.* In fact, he may even be the safest. If he knows his own limitations, narrow as they are, and always stays within them, then he is far and away a safer pilot than the "super stick" who is continuously pushing the edge of his own envelope. In fact, statistics show most mishaps involve pilots within a specific zone of experience which generally does not include the novice aviator.

So there you have it. You've heard it all before . . . and if you follow the cliches of aviation safety, you'll live to hear it all again. ◄

Lt. Rutherford is an F/A-18 pilot with VFA-113. He is the squadron safety officer.

Cold Weather: Are You Prepared to Survive?

By Capt. K.R. Koskella

WHEN it's fall in the valleys, it's already winter in the mountains. Most of us tend to dress for our flights in the clothing that is appropriate for the weather along our planned flight route. A recent U.S. Air Force review of actual winter survival episodes indicated that death was most likely under the following conditions: (1) the aircrewman wore inadequate clothing for the climate, (2) the aircrewman was injured and (3) the aircrewman had little knowledge of proper winter survival techniques. THE MESSAGE — Dress and prepare for the worst conditions that you will fly over!!!

Hypothermia (a reduction in body core temperature) is the No. 1 winter killer. Death can occur after prolonged exposure in water of 70 degrees Fahrenheit or to air in the 30 to 50 degree Fahrenheit range. Harsher conditions result in quicker demise.

Because water has a greater heat capacity and conductivity when compared with air, immersion in cold water or exposure to cold air with wet clothing accelerates heat loss. When the body transfers heat to the environment faster than metabolic processes can produce it, the body core temperature declines and basic body chemical reactions slow down or stop. When body core temperature reaches 98 degrees Fahrenheit, shivering begins. This muscular activity produces heat, but it also increases the rate of heat loss — a no-win situation if the heat loss is not reversed. If the body core temperature reaches 90 degrees Fahrenheit, loss of consciousness is

most likely. At 85 degrees Fahrenheit, death is probable due to cardiac arrest.

Immersion in cold water creates the worst case for survival. In water at 50 degrees Fahrenheit, you could expect to live for four hours using flotation gear and assuming the knee-chest "H.E.L.P." position. Swimming or treading water will decrease survival time to two hours through increased heat production in muscles and a greater rate of heat loss. Moving in the water creates a "wind chill" effect. Drownproofing will further reduce survival time to 1.5 hours due to additional heat loss caused by immersing the head (a great radiator) in the water. The average trim-figured survivor in a flight suit cannot swim one mile in 50-degree-Fahrenheit water prior to succumbing to hypothermia..

To survive in cold water, flotation gear is a *MUST.* Avoid unnecessary movement, and get out of the water *ASAP.*

Similar problems occur in cold air with wet clothing for essentially the same reasons. There are two specific conditions to be aware of: immersion foot and frostbite.

Immersion foot is a disabling condition caused by prolonged exposure of the feet to moisture and temperatures below 70 degrees Fahrenheit. The continued transfer of heat to the environment can exceed the circulatory system's ability to supply heat, resulting in local or extensive tissue damage. The resulting pain can prevent walking.

Frostbite is the condition where water actually freezes the cells. This, of course, kills the tissue and damages the surrounding area. (Still, frozen tissue keeps well.) Frostbite primarily occurs in wet feet and fingers and exposed portions of the head. The first symptom is pain (stinging) or numbness, with the involved part appearing firm, waxy-yellow and cold.

Treatment of hypothermia involves rewarming. In the survival situation, this is best done utilizing a fire for warmth, dry clothes and warm liquids by mouth in a conscious patient.

Prevention of immersion foot or frostbite is preferable to treatment. Plastic trash bags are useful to keep socks dry to retain their insulating capability. Put your bare foot into a large piece of plastic, put your sock on, then put another layer of plastic over your sock prior to donning the shoe. This trick will reduce heat loss from the feet.

The only treatment available for immersion foot is dry footwear. Frostbite is treated by gradual rewarming of the affected part (such as frozen toes in someone's armpit). Never rub snow on a frostbitten body part, and never rub or massage it at all! If a hand or foot is severely frostbitten/frozen, it may be best to leave it frozen. You

can walk on a frozen foot, but not on one that has thawed. Severe pain, infection and total disability will accompany thawing.

The clothing you man-up your trusty aircraft with is most likely what you'll have available to survive in. At the very least, if you fly over cold terrain, you should carry survival clothing. ***Regular flight boots are totally inadequate for winter survival.*** They cannot be adequately waterproofed, and the steel toe inserts act as an effective cold sink. The single most common complaint obtained from actual survivors is frozen feet. The U.S. Air Force has good winter flying shoes available through supply (FSN DLA 100-79-C-2386) but lacking a steel toe insert, they aren't legal to use. Several Navy squadrons use them anyway, accepting the tradeoff of less toe protection for increased warmth and water resistance. Inside the shoes, wear a good quality wool sock; it's not a bad idea to have a spare set of socks in a pocket somewhere. Heavy winter underwear (the green quilted type, CWU-9/P), winter flying gloves and a standard knitted watch cap will complete your camping attire. In VX-5, we also issue each aircrewman a locally made-up survival kit containing four white candles, one box of waterproof matches, a razor blade, five feet of aluminum foil, several fish hooks and monofilament line (needle and thread) and several large plastic bags. This all fits nicely into a MAF bag, which, in turn, fits into a G-suit or flight suit pocket.

Once on the ground in the winter, your priorities are warmth (shelter), water, signaling and food. If firewood is readily available, building a fire, then constructing a shelter assumes priority. In deep snow country, experience has demonstrated that building a snow cave is the *only* way to survive 24 hours. No one claims that a snow cave will be comfortable, but air trapped in the surrounding snow will serve as insulation. The 32 to 40 degrees Fahrenheit obtainable in a good snow cave is survivable while the minus 40-degree-Fahrenheit night temperature in the mountains is not.

A tactical jet aviator should have everything he needs to construct his snow cave. The LR1 life raft serves as a waterproof barrier to kneel upon while working, minimizing wetness. The survival knife is used to cut and loosen snow, which is then scooped with a helmet visor into one-half of the seat pan for removal. Work hard enough to stay warm, but don't sweat excessively. It may be a good idea to partially undress to minimize wet clothing.

Select a spot to dig. A depression underneath a large tree will allow a horizontal tunnel, but the snow is usually hard and frozen. A hillside may be good if avalanche danger is minimal. On the level, you must dig down an incline to about 5 feet below the surface, then excavate a room at least 3 feet by 4 feet by 4 feet.

Features that should be incorporated into your dwelling include:

- *A vent in the top* — a vent is necessary to prevent carbon dioxide accumulation and asphyxiation. A straight stick can be poked through the roof carefully, left in place and wiggled occasionally.
- *Adequate snow depth above* — you need 2 feet of snow over your head. If the snow depth is too shallow, or the snow too dry to dig in, dig a hole, cover it with sticks and branches, then pile snow over it.
- *A cover for the entrance* — snow or parachute material can close the door to prevent heat loss. Leave a small opening for air.
- *A cold sink* — dig a shallow trench for the coldest air to settle into.
- *A bench/bed* — well above the cave's lowest point, construct a flat surface. Cover it with branches, your life raft and wrap up in your parachute.
- *An escape route* — attach a shroud line to one wrist and affix it to something outside; you then have a direction to go in case of cave in.
- *A candle* — a candle will warm and brighten the interior, as well as provide a way to melt ice to drink.

Once a shelter or fire is available, water becomes of interest, since dehydration reduces your tolerance to cold weather. *Never* eat snow, however. Snow or ice at 32 degrees Fahrenheit absorbs a large amount of (heat) energy from your body to convert it to the liquid state at the same temperature. This will kill you in short order. Warm liquids are ideal; a cup fashioned from tin foil and warmed by a candle will allow you to melt ice and warm it. Snow can be melted, but large quantities of snow produce small quantities of water.

Food, in a real cold weather survival situation, becomes a nearly insurmountable problem. There is none available in most cases.

Signaling skills may make the difference between rescue and death. A PRC-90 radio is useful for line-of-sight communications. Don't waste the battery during the night or in inclement weather. It's helpful to remove the battery during periods of non-use, keeping it in a warm pocket. A mirror works well in good weather. A bright fire at night is excellent, and a smoke-producing fire in the daytime (green branches, aircraft tire) gets attention. A day flare offers good contrast with the snow, and a sea dye marker trampled into the snow in the form of a message shows up for miles.

Snow blindness can be prevented by wearing sunglasses, a dark visor or making goggles by cutting two narrow slits into the cover of an IFR en route supplement.

In summary, requirements for cold weather survival include:

- Adequate equipment, especially foot gear.
- An understanding of priorities (i.e., warmth/shelter, water, signaling, food).

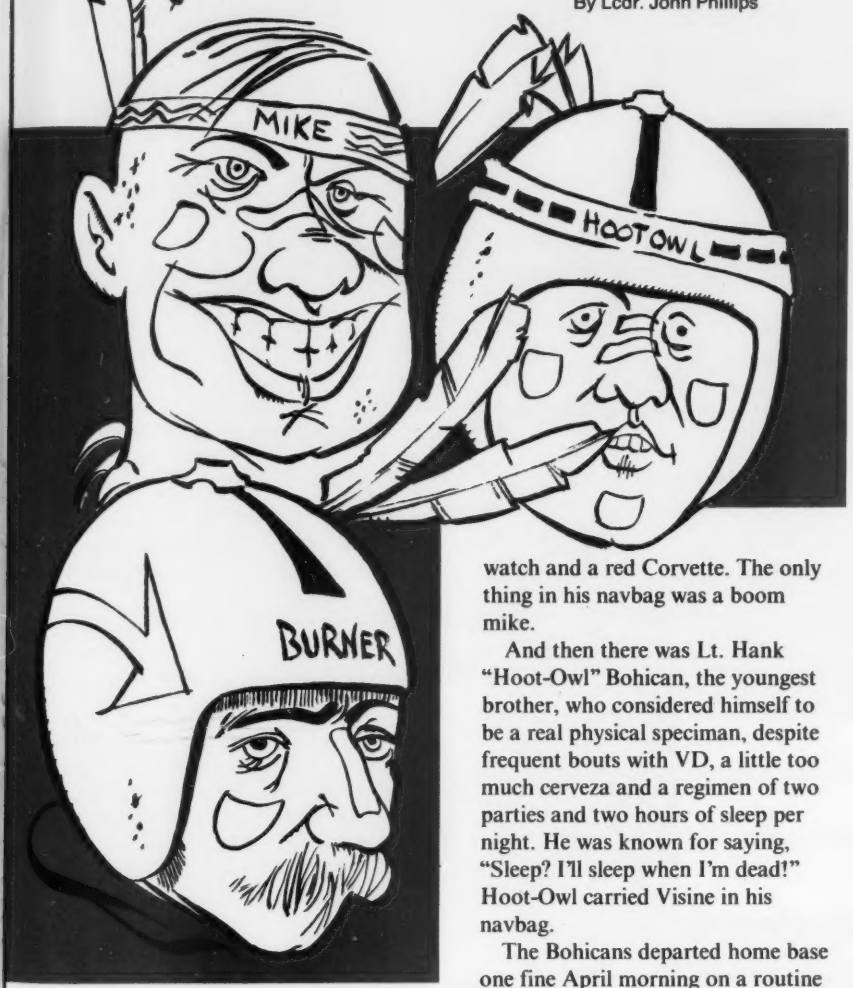
◄

Capt. Koskella is a dual-designated flight surgeon and pilot currently assigned to VX-5.

The Last of the Bohicans

(with apologies to James Fenimore Cooper)

By Lcdr. John Phillips



THIS is the story of three brothers, all A-7 drivers in the same squadron: the Flying Bohican Brothers. The oldest brother was Cdr. Mike "Midas" Bohican, the XO. Heavily invested in stocks, he was also involved in several land development deals, a lengthy alimony battle with his second wife and was also expanding his "Whamway" sales empire into Mozambique. He carried a *Wall Street Journal* in his navbag.

The second brother, Lcdr. Brian "Burner" Bohican, was a frustrated fighter pilot with a big moustache, a watch and a red Corvette. The only thing in his navbag was a boom mike.

And then there was Lt. Hank "Hoot-Owl" Bohican, the youngest brother, who considered himself to be a real physical speciman, despite frequent bouts with VD, a little too much cerveza and a regimen of two parties and two hours of sleep per night. He was known for saying, "Sleep? I'll sleep when I'm dead!" Hoot-Owl carried Visine in his navbag.

The Bohicans departed home base one fine April morning on a routine bombing mission to the Desert Gulch target complex. Midas took the lead, as he had some business correspondence to work on during the flight. Hoot-Owl hung in there as No. 2 — it was all he could handle in his weakened condition. Burner flew a wide No. 3, all the better to work on his inverted flight and smoke one of his hand-rolled "gars."

Midas decided to enter the target complex through Carrion Canyon, a fun little unofficial low-level route he remembered from his A-4 days. He didn't have a chart, but he still remembered it pretty well. Besides, one of his business friends had told him Carrion Canyon was "the next Palm Springs," so he wanted to check it out.

The canyon was just as advertised; scenic, good water and many improvements already in progress. Midas was sketching future subdivision layouts on his kneeboard card when he encountered one of those improvements, an array of power lines which ripped his wings off. Hoot-Owl, hanging in in IFR parade with his extra dark shades on, never knew what hit him.

Burner? He saw the power lines but couldn't warn the flight, since his mask was off and his boom mike swung out of the way so he could smoke his stogie. Burner didn't hit the power lines; he was able to pull up and miss them. But since he was inverted at the time, he "pulled up" right into the same smoking hole that had claimed his brothers. The only recognizable objects found by the investigators were a *Wall Street Journal*, a boom mike and a bottle of Visine.

All of us have elements of Midas, Burner and Hoot-Owl in us. The key factor in the demise of the Bohicans is that they weren't prepared to fly; Midas due to preoccupation, Burner due to cockiness and complacency and Hoot-Owl because of overindulgence. We must all recognize these mental and physical factors within ourselves, evaluate them frankly and minimize their effects before strapping in. Sound mental and physical preparedness can overcome aircraft problems, but no airplane can make up for an unprepared or inattentive pilot.

Lcdr. Phillips is with VA-305.

Let's Discover What To Be Careful About

By Capt. Tom Hardenbergh, USMC

SAFETY, that gray area of naval aviation that everyone talks about but that no one can get a firm hold on. Safety, where mishap rates are published, "Atta Boys" awarded for mishap-free flight hours/years and CNO Aviation Safety Awards are given for particularly noteworthy years, but all of those kinds of things are long-term reminders to a squadron commanding officer that his command has achieved some milestone. How much better and more appropriate, if as an ASO, you could keep him informed monthly about his squadron's safety awareness. Ah, you say, this guy's going to suggest that we do a safety survey every month and what has he been smoking? I realize that an in-depth survey takes a team of professionals at least two days, but how about a quick and easy survey that the ASO can do in the privacy of his office in about half an hour. Not only that but let's give the result a quantitative answer. The Monthly Safety Posture Report on the following page allows the ASO to do just that. The idea was first implemented in the late 70s at VMFA-323 in El Toro and then in 1980 at VMFA-235 in Hawaii and is now available to all of MAG-24.

Historically, a raw score of 90, with no insidious incidents or adverse trends, indicates that the squadron is on track for the previous month. With special interest given to the events listed in paragraphs V and VI, the squadron can look forward to a safe and successful upcoming month, which is what we are trying to ensure in the first place. So now when the skipper says "How are we doing?" your answer can be a number that he can recognize as a flag — 90 and above; we're doing well or less than 90; we're in the *other* column, and we need some special attention.

Although some questions seem totally objective, each is subject to interpretation. For example, question II.e., if the squadron did not have any emergencies that had to be handled in accordance with NATOPS, then no points are deducted. Likewise, if there was just one emergency that became more serious than it should have, subtract all six points.

This report is an effective tool to keep safety awareness high and to keep the squadron commanding officer informed in a matter of fact/no holds barred approach concerning his squadron's underlying safety posture. Remember, the ultimate goal of any safety department is to identify a hazard and eliminate it. So let's not only be careful out there, but let's also anticipate what we must be careful about. ◄

MONTHLY SAFETY POSTURE REPORT

I. Avoidable Incident Rate: 25 Points Possible **Points Awarded _____**

One point will be awarded each flying day that passes without a preventable aviation-related mishap occurring. Points may also be deducted up to a total of five for a particularly incidious incident.

II. NATOPS Posture: 25 Points Possible **Points Awarded _____**

a. Five points awarded for all NATOPS Quals being up to date. _____

b. One point awarded for each well presented NATOPS instruction period. _____

c. One point awarded for each NATOPS quiz with a squadron average of over 90 percent. _____

d. Three points awarded for a critical action emergency quiz passed by all squadron members. (Pass + 100 percent) _____

e. One point awarded for proper use of NATOPS procedures used in flight emergencies for a maximum of six. _____

f. One point awarded for each well conducted brief and debrief monitored during month with a maximum of five possible. _____

III. Ground Posture: 25 Points Possible **Points Awarded _____**

a. Four points awarded for good performance on the monthly ground safety inspection of work spaces, including neatness and cleanliness. _____

b. Three points awarded for the proper utilization of up, well maintained GSE during the month. _____

c. Four points awarded for accident-free vehicle operation by squadron members. _____

d. Four points awarded for a zero recreational accident rate for the month. _____

IV. Communication and Management: 35 Points Possible **Points Awarded _____**

a. Three points for safety committee meetings held. _____

b. Three points for an up-to-date pre-mishap plan. _____

c. Two points for all shops with a safety NCO assigned. _____

d. Three points for a low avoidable abort rate. _____

e. Two points for publishing a firm, detailed flight schedule. _____

f. Two points awarded for the level of interest the operations department takes in accomplishment of flight requirements on syllabus hops. _____

g. Three points awarded for maintaining a viable tech training program. _____

h. Two points for holding weekly AOMs. _____

i. Four points awarded for detailed QA audits held. _____

j. Two points awarded for effective department head meetings. _____

k. Two points awarded for accomplishing all hearing conservation tests scheduled in the maintenance plan. _____

l. Two points awarded for holding the number of deferred gripes to a minimum. _____

m. Two points for having very few repeat gripes. _____

V. Narrative Projection of Next Month's Operations:

VI. Factors Affecting Squadron Safety Beyond the Control of Squadron Personnel:

Capt. Hardenbergh is an F-4 RIO with over 1,600 hours and a veteran of three WESTPAC deployments. He has served with VMFA 323, 314 and 235 and is currently the aviation safety officer for MAG 24.

Naval Aviators in Light Airplanes

By Cdr. Bill Siegel

AS naval aviators, we are constantly being screened to ensure that our performance and capability match that of our mission and hardware. When we venture into the world of light civilian aviation, we assume that we have all the knowledge and skill required to perform in that environment as well.

This attitude is institutionalized by the FAA when it grants us a commercial pilot certificate with instrument rating after we pass a simple written exam. A military pilot who acquires his FAA ticket in this manner can get a quick checkout at his local flying club and be considered fully qualified to take his family into the "goo" at San Francisco International.

We may possess the *capability* to perform as FAA commercial pilots but *there are a number of differences* in the environment and equipment which make the easy qualification process inherently dangerous.

A major difference is in the aircraft, involving the *inertial-to-viscous force ratio*. This relates the mass of the aircraft to its surface area. It is analogous to the difference between a bowling ball and a volley ball when both are traveling at 20 knots and both are exposed to 10-knot wind gusts. Turbulent air for a light aircraft is not only uncomfortable, it is dangerous because relatively small gusts can cause uncontrollable flight.

As a related issue, wake turbulence from a heavy aircraft can also render you uncontrollable, and you may not have the excess power to make up for a poor decision. To avoid wake turbulence, the FAA has published an advisory circular covering the subject with specific guidelines for light aircraft. You can't make up for a 300-degree/sec roll rate induced by the wake of a 747 with your skill and cunning. Read the gouge and follow it.

Icing is something that jet pilots don't especially fear. Their aircraft are usually going fast enough to avoid ice buildup due to friction heating. Also, they can fly well above the freezing level, if needed. The light aircraft optimum altitude for cruise, especially in the mountains, is quite often dangerously close to the freezing level. Experienced recip pilots are aware of the freezing level on every flight and closely monitor the outside temperature when in areas of visible moisture. They also know when to use the *carburetor*

heat handle. Those of you who were weaned on jets should find an old S-2 pilot and pick his brain on these subjects. If not, read every word in the FAA flight training manual.

The fuel gauges in light aircraft are inherently inaccurate. As military pilots, we are used to better. Light plane pilots start with a full tank and plan their missions based on the book-derived fuel flow and the number of hours spent in cruise. The fuel gauges are basically worthless and only used as a cross check. Get in the habit of planning your long flights using the classic method with charts, plotters, winds, fuel figures, etc. If you rely on fuel gauge readings, you may not get there.

Non-pilots and commanding officers are much more impressed with those pilots who always have enough gas for each mission. They are much less impressed with those who have the demonstrated ability to dead stick one in that is out of petrol. Don't forget to check the quality as well as the quantity of the fuel prior to each flight. Aircraft don't run well on water.

VOR and ILS approaches are a *piece of cake*. The standard light plane VOR gauge is different in concept than those used by the military. Also, you may not be accustomed to flying instruments without DME even though this is common in the private world. Get a good checkout on the gear and shoot some hooded ILS approaches before venturing into even marginal weather.

They don't include energy maneuverability and specific excess power plots in light aircraft manuals because excess power is a foreign concept. When you cross a mountain ridge at 9,500 feet in your Cessna 172 or your Cherokee 180 and encounter a 1,000-fpm downdraft, you can't tap burner to save yourself. Check the weather. Plan to cross ridges and mountains with plenty of ground clearance.

Question: How do you get into Lake Tahoe IFR in a Cherokee? Answer: You don't. Lake Tahoe doesn't have an ILS because the terrain doesn't meet the ILS waveoff criteria. The VOR approach requires a DME because you can't pick up Reno VOR for cross-referencing when below the mountains. You will also probably be at the freezing level in the goo. Do you need any more reasons? Don't go there if the weather is bad. More importantly, stay there until the weather is good! When flying light planes, you need to know details about your destination you might have been able to overlook in your military aircraft.

Question: How do you get into a non-tower airport like Visalia in the winter when you can see the field from five miles while airborne? Answer: Carefully. Visalia has no tower but it has a control zone. If the local ground observer declares the field below VFR minimums, then you can't enter the control zone and land regardless of your airborne visibility. There are four ways to find out if Visalia is operating under IFR even though VMC. If you are not familiar with how to find out, and with the other non-tower procedures, you have some work to do before your next Cessna launch.

Landings are easy in a light aircraft. You merely hold approach speed, using flaps, if needed, to increase sink rate and transition to a nice flare and touchdown. Don't forget the last part; it is important. Being on speed, on centerline, on glideslope with 500 fpm may work for an F/A-18 trap at the boat but it is terrible technique in a Centurion or Sierra at Hanford. Flare to land. If you don't know how, get someone to teach you so you don't overstress your gear, your marriage or your reputation. Land softly. Remember flying a light plane is more like making love than hammering nails.

As naval aviators, we seldom cancel a flight due to weather because our equipment is sophisticated and powerful enough to allow us to fly through, around or over trouble. This attitude should not be carried over to light aircraft. Frequently, icing, turbulence, wind, snow, etc., dictate that light aircraft should not launch regardless of the skill of the pilot. *Don't go when you shouldn't!* ◄

Cdr. Siegel flew A-4s and A-7s in various attack squadrons and served as engineering test pilot at the Air Force's Aerospace Research Pilot's School. He is currently the Aeronautical Engineering Cirriculum Officer at the Naval Postgraduate School.

Lt. Keith C. Craft (left),
Lcdr. Eric E. Morton (right)

Lcdr. Eric E. Morton
Lt. Keith C. Craft
VA-95 "Green Lizards"

Lcdr. Eric Morton and his B/N, Lt. Keith Craft, were the crew in Lizard 515 poised on cat 4 of USS *Enterprise* ready for a routine night launch and overhead tanker mission. Shortly after the cat fired and prior to becoming airborne, the VDI (primary altitude reference) failed. A loud pop, accompanied by electrical arcing and sparks, were observed coming from the B/N's circuit breaker panel as both generators dropped off line. Rotation off the cat was accomplished in the dark until Craft illuminated the flight instruments with his flashlight. Through the smoke-filled cockpit, Morton was able to determine that a positive rate of climb was established and the RAT (ram air turbine) was deployed to regain essential instrument lights and communication. The crew stayed with the aircraft due to the "good shot seat of the pants feeling," sound of both engines at high power and the quick reaction of the B/N illuminating vital flight instruments. Required NATOPS procedures for electrical fire/smoke and fumes in the cockpit were followed, an emergency was declared and fuel dumping started. Morton attempted resetting the generators but severe arcing and sparks precluded regaining their use. The approach and arrestment on board USS *Enterprise* were made on emergency power.

Post-flight inspection revealed a massive electrical failure in the B/N CB panel which burned completely through the cockpit aft pressure bulkhead adjacent to the air conditioning turbine and main fuselage fuel cell.

Solid professionalism and smooth crew coordination averted what could have been a sure disaster and loss of a valuable asset.

BRAVO ZULU

Capt. Fred Smithberg
1st Lt. Marvin Roberts
HMA-369

A "Real Aviator" (Approach Jan '83) would have flown it back to base. Capt. Fred Smithberg and 1st Lt. Marv Roberts would rather be accused of eating quiche than be handed that old line.

Smithberg was leading a section of AH-1J Cobra helicopters to the expeditionary airfield at 29 Palms, California. Approximately 10 minutes from base and over mountainous terrain, his wingman began to experience pitot-static problems. Smithberg had his wingman take safe separation interval and loitered the flight to assess the situation. Shortly thereafter, the decision was made to return to Camp Pendleton and a rendezvous was initiated.

During the joinup, Smithberg and Roberts heard a loud snapping noise, and the No. 2 engine rapidly began winding down. Smithberg immediately recognized the emergency, lowered the collective, increased the good engine to max RPM and established a by-the-book approach to a large, flat plateau he had scanned while circling. At this time he called the wingman explaining the situation and his intent to land.

During the approach, Roberts responded with the vital copilot coordination required by calling out airspeeds, altitudes, engine performance data on the good engine and maintaining an outside scan for obstacles in the landing zone. Excellent crew coordination paid off as the aircraft approached the zone. Entering ground effect, the aircraft was skillfully maneuvered to avoid protruding rocks and poor terrain not visible from altitude. Single-engine performance was maintained within limits, thus saving the remaining engine.

After landing, the engine was secured and a normal shutdown was completed. A thorough postflight revealed minor damage to the port skid tube caused by a sunken boulder. This later proved to be the only damage to the aircraft.

Extended flight is not recommended for Cobra single-engine failure procedures; landing site and duration of flight are left to the discretion of the pilot in command. With no indication of what had caused the first engine to fail, Smithberg's decision to land was not only the prudent thing to do, but also demonstrated mature headwork.

The actions of Smithberg and Roberts resulted in the safe recovery of a valuable aircraft and crew.

1st Lt. Marvin Roberts (left), Capt. Fred Smithberg (right).

Near Midair Collision Word Scramble

Y O N O I T C E T E D U P D W S T I E
L Y E C L B M O N I T O R E T E H C N
S C A M N N E F I N O A A L E E N L I
E N R V O R F A C R Z V S F T A P O R
L E M S I U O R S A I E D I R N U S T
U C I V T T N C H S B E P A R D S U C
R A D C N G A N U O R O E V I A D R O
E L A M E N O A R D E L D I B V A E D
S P I I T I L T N N C T G L S O E R T
R M R E T R S U B D N O I P A I H A U
U O R A A A H E U P A N L T A D Y T O
O C I N T E L O A S D I O L R T N E K
C V G B V L L S W S I E T W I O E E O
A E N I Y C S I P Y O O U U R S P A O
I R F U C I V O R A V F C T A N I E L
D O P T V E T H E R A A A I R C R O R
A F T E L N O I T C A E V I S A V E N

Words and phrases associated with NMACs can be found in this puzzle. The words can be oriented up, down or diagonally.

Near midair
IMC vs VMC
Cloud clearance
Clearing turn
Monitor
Poor scan
Complacency
Course rules
See and avoid
Belly up
Look out doctrine
Visual range
Blind spot
Acuity
Collision
Avoidance
Detection
Evasive action
Closure rate
Five hundred feet
Strobes
Swivel
Heads up
Passive
Attention
Aviation hazard
Report it

Submitted by Capt. Rick Curlin, USMC
VT-10 Safety Officer

☆U.S. GOVERNMENT PRINTING OFFICE: 1985- 537-011:119

No approach is so bad that it can't be salvaged.

Naval Safety Center
NAS Norfolk, Virginia

Poster idea contributed by VA-106

Some flyers

don't give

FOD

a second thought.

How about you?